

**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**

PATENTIN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Oleg Kiselev  
Assignee: VERITAS Software Corporation  
Title: Application-Assisted Recovery from Data Corruption in Parity  
RAID Storage Using Successive Re-reads  
Application No.: 10/614,306 Filing Date: July 3, 2003  
Examiner: Unassigned Group Art Unit: 2186  
Docket No.: VRT0059US Confirmation No.: 8239

---

Austin, Texas  
May 14, 2004

Mail Stop Petition  
COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, VA 22313-1450

**PETITION TO MAKE SPECIAL UNDER 37 CFR §1.102(d)**

Dear Sir:

The applicants hereby petition pursuant to 37 CFR §1.102(d) and MPEP § 708.02(VIII) to make the above-identified application special. Please charge Deposit Account No. 502306 for the fee of \$130.00 for this petition as set forth in 37 CFR §1.17(h).

Should the Office determine that all the claims presented are not obviously directed to a single invention, the applicants will make an election without traverse as a prerequisite to the grant of special status.

PATENT

The applicants respectfully submit that a pre-examination search has been performed by a professional search firm in the following classes/subclasses:

Class	Subclasses
G06F (Electrical Digital Data Processing)	03/06 12/08 12/10 12/16 13/14
714 (Error Detection/Correction and Fault Detection/Recovery)	006 007 048
711 (Electrical Computers and Digital Processing Systems: Memory)	004 136 114 154 202

Enclosed are copies of the following references which are presently believed to be, from among those made of record in the accompanying Information Disclosure Statement and any previously filed Information Disclosure Statement, the most closely related to the subject matter encompassed by the claims:

Japanese Patent No. 11-224166	Kuniaki
U.S. Patent No. 6,327,638 B1	Kirby
U.S. Patent No. 6,460,122 B1	Otterness et al.
U.S. Patent No. 6,704,837 B2	Beardsley et al.

*Detailed Discussion of the References*

U.S. Patent No. 6,460,122 issued October 1, 2002, to Otterness et al. ("Otterness"). Otterness provides a multiple level cache structure and multiple level caching method that distributes I/O processing loads including caching operations between processors to provide high performance I/O processing, especially in a server environment. Otterness achieves optimal data throughput by taking advantage of multiple processing resources. Otterness manages the allocation of the data caches to optimize the host access time and parity generation.

Otterness teaches a cache allocation for RAID stripes guaranteed to provide fast access times for the XOR engine by ensuring that all cache lines are allocated from the same cache level. Otterness discloses allocation of cache lines for RAID levels which do not require parity generation and are allocated in such manner as to maximize use of the memory bandwidth. Parity generation which is optimized for use of the processor least utilized at the time the cache lines are allocated, thereby providing for dynamic load balancing amongst the multiple processing resources, is disclosed. A cache line descriptor for maintaining information about which cache data pulled the cache line resides within, and a cache line descriptor which includes enhancements to allow for movement of cache data from one cache level to another is disclosed. The cache line descriptor with enhancements for tracking the cache within which RAID strip cache lines siblings reside is disclosed.

Claim 1 of the instant application requires (1) receiving a first request to read data of a stripe unit  $B_x$  of a stripe; (2) returning data of stripe unit  $B_x$ ; (3) receiving a second request to read data of stripe unit  $B_x$ ; (4) generating new data for stripe unit  $B_x$  in response to receiving the second request; and (5) returning the new data. While Otterness describes use of a RAID storage system, the foregoing description of Otterness does not teach nor fairly suggest the limitations (1) – (5) either alone or in combination with the remaining limitations of claim 1. Accordingly, Applicant submits that the independent claim 1 is distinguishable over Otterness.

PATENT

Claim 15 of the instant application requires (A) comparing an identification for stripe unit  $B_x$  with identifications for stripe units stored in a table in memory; (B) if the identification for stripe unit  $B_x$  does not compare equally then storing the identification for stripe unit  $B_x$  in the table and returning data of the stripe unit; (C) if the identification for stripe unit  $B_x$  does compare equally then generating new data for stripe unit  $B_x$  and returning the new data. Ottermess does not teach nor fairly suggest the limitations (A) – (C) either alone or in combination with the remaining limitations of claim 15.

Accordingly, Applicant submits that the independent claim 15 is distinguishable over Ottermess.

U.S. Patent 6,327,638 issued December 4, 2001, to Kirby ("Kirby"). Kirby relates to a disk striping method and storage subsystem using the disk striping method. Kirby uses the method to assure substantially a constant performance across all zones of the disk drive when transferring data to or from the disk drive. Generally, Kirby stripes data over a plurality of disks such that half the disks map sequential block addresses from outer to inner zones of the disk drive and the other half maps addresses from the inner to outer zones. For example, where half the data in a stripe is manipulated on faster outer zones, the other half is manipulated on correspondingly slower inner zones of the disk drive. Or where half the data in a stripe is manipulated on middle zones, the other half of the data is also manipulated in middle zones thereby achieving a more consistent average sustained I/O performance.

While Kirby describes a RAID subsystem for storing data, Kirby fails to teach or fairly suggest (1) receiving a first request to read data of a stripe unit  $B_x$  of a stripe; (2) returning data of stripe unit  $B_x$ ; (3) receiving a second request to read data of stripe unit  $B_x$ ; (4) generating new data for stripe unit  $B_x$  in response to receiving the second request; and (5) returning the new data, either alone or in combination with the remaining limitations of claim 1. Moreover, Kirby fails to teach or fairly suggest (A) comparing an identification for stripe unit  $B_x$  with identifications for stripe units stored in a table in memory; (B) if the identification for stripe unit  $B_x$  does not compare equally then storing the identification for stripe unit  $B_x$  in the table and returning data of the stripe unit; (C) if the identification for stripe unit  $B_x$  does compare equally then generating new data for

PATENT

stripe unit  $B_x$  and returning the new data, either alone or in combination with the remaining limitations of claim 15.

U.S. Patent No. 6,704,837 to Beardsley et al. ("Beardsley") issued March 9, 2004. Beardsley relates to a method and apparatus for increasing RAID write performance by maintaining a full track write counter. Figure 1 illustrates a block diagram of RAID system 100 employing Beardsley's invention. System 100 includes a RAID array of hard disks 146 – 152. In the past, when performing a RAID write, the RAID write may not contain a stripe with a full tracks. To perform the write, the parity must first be read, then the new parity generated, and finally the data and new parity can be written. To optimize this process, the parity read can be avoided by writing a stripe width of full tracks. During a write, an assumption that a stripe of full tracks exist must be made and then the tracks are grouped. Nevertheless, during the grouping, the controller may discover that a stripe of full tracks does not exist, yet the write will still include a parity read and the overhead doing the track grouping has been incurred.

Beardsley purports to avoid unnecessary track grouping during writes by using a full track write counter. When a write request is received in Beardsley, a full track write counter for tracks and a stripe of tracks associated with the write request is analyzed to determine whether the write request involves a full track write. Beardsley then describes subsequently executing a cache destage based on the analysis of the full track write counter for tracks and a stripe of tracks associated with the write request.

While Beardsley describes use of a RAID storage subsystem, the foregoing description of Beardsley fails to teach or fairly suggest (1) receiving a first request to read data of a stripe unit  $B_x$  of a stripe; (2) returning data of stripe unit  $B_x$ ; (3) receiving a second request to read data of stripe unit  $B_x$ ; (4) generating new data for stripe unit  $B_x$  in response to receiving the second request; and (5) returning the new data, either alone or in combination with the remaining limitations of claim 1. Moreover, Beardsley fails to teach or fairly suggest (A) comparing an identification for stripe unit  $B_x$  with identifications for stripe units stored in a table in memory; (B) if the identification for stripe unit  $B_x$  does not compare equally then storing the identification for stripe unit  $B_x$  in the table and returning data of the stripe unit; (C) if the identification for stripe unit  $B_x$

PATENT

does compare equally then generating new data for stripe unit  $B_x$  and returning the new data, either alone or in combination with the remaining limitations of claim 15.

Japanese Patent 11-224166 issued to Kuniaki ("Kuniaki") based upon application No. 10024592. Kuniaki relates to a fault avoiding method for storage area in log in type disk storage device and computer readable storage medium used in the same device. According to the abstract of 10024592, Kuniaki discloses a system which includes a logical address conversion table 22, a stripe management table 23, a redundant information generating means 24, a data recovering means 25, an access limitation start fixed fault stripe number storage means 26, and write buffer 27. Kuniaki can improve avoidance of a fault due to a fixed failure in a heart of a storage device.

While Kuniaki appears to employ RAID storage, the English abstract of Kuniaki fails to teach or fairly suggest (1) receiving a first request to read data of a stripe unit  $B_x$  of a stripe; (2) returning data of stripe unit  $B_x$ ; (3) receiving a second request to read data of stripe unit  $B_x$ ; (4) generating new data for stripe unit  $B_x$  in response to receiving the second request; and (5) returning the new data, either alone or in combination with the remaining limitations of claim 1. Moreover, the English abstract fails to teach or fairly suggest (A) comparing an identification for stripe unit  $B_x$  with identifications for stripe units stored in a table in memory; (B) if the identification for stripe unit  $B_x$  does not compare equally then storing the identification for stripe unit  $B_x$  in the table and returning data of the stripe unit; (C) if the identification for stripe unit  $B_x$  does compare equally then generating new data for stripe unit  $B_x$  and returning the new data, either alone or in combination with the remaining limitations of claim 15.

PATENTCONCLUSION

Applicant respectfully requests that this petition be granted, and that the present application receive expedited examination. Should any issues remain that might be subject to resolution through a telephonic interview, the Office is requested to telephone the undersigned.

**EXPRESS MAIL NO:**

EV 304739210 US

Respectfully submitted,



Eric A. Stephenson  
Attorney for Applicant(s)  
Reg. No. 38,321  
512-439-5093 (Phone)  
512-439-5099 (Fax)



E I I E COPY

MAIL STOP PETITION  
 COMMISSIONER FOR PATENTS  
 P. O. BOX 1450  
 ALEXANDRIA, VA 22313-1450

DT02 Rec'd PCT/PTO 1 4 MAY 2004

Applicant(s): Oleg Kiselev  
 Assignee: VERITAS Software Corporation  
 Title: Application-Assisted Recovery From Data Corruption in Parity RAID  
 Storage Using Successive Re-reads  
 Application No.: 10/614,306  
 Filing Date: July 3, 2003  
 Attorney Docket: VRT0059US

## ENCLOSED:

1. This Return Receipt Postcard
2. Transmittal Letter - 1 page (in duplicate)
3. Petition to Make Special Under 37 CFR §1.102(d) - 7 pages
4. Copies of 4 references for accompanying Petition
5. Information Disclosure Statement Under 37 CFR §1.97(b) - 1 page
6. PTO 1449 (citing 34 references) - 1 page
7. Copies of 19 foreign cited references

EAS/rdd

Date Mailed: May 14, 2004

Express Mail Label No.: EV 304739210 US

ORIGIN (POSTAL USE ONLY)		DELIVERY (POSTAL USE ONLY)	
PO ZIP Code 78731	Day of Delivery First <input type="checkbox"/> Second <input checked="" type="checkbox"/>	Delivery Attempt Mo. Day Time Employee Signature	
Date In 5/14/04	Postage \$ 2.10	Delivery Attempt Mo. Day Time Employee Signature	
Mo. Day Year 5 14 2004	12 Noon <input type="checkbox"/> 3 PM <input type="checkbox"/>	Delivery Date Mo. Day Time Employee Signature	
Time In 3:30	Military <input type="checkbox"/> 2nd Day <input type="checkbox"/> 3rd Day <input type="checkbox"/>	Mo. Day Time Employee Signature	
<input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	Int'l Alpha Country Code	NO DELIVERY <input type="checkbox"/> Return to Sender <input type="checkbox"/>	
Weight 3.0	Insured Alpha Country Code		
No Delivery <input type="checkbox"/>	Accepted Clerk Initials		
Weekdays <input type="checkbox"/> Holidays <input type="checkbox"/>	Total Postage & Fees \$ 2.10		
CUSTOMER USE ONLY		CUSTOMER USE ONLY	
METHOD OF PAYMENT		METHOD OF PAYMENT	
Express Mail Corporate Acct. No. 4787096		Federal Agency Acct. No. or Postal Service Acct. No.	
FROM: (PLEASE PRINT)		TO: (PLEASE PRINT)	
CSA LLP 4807 SPICERWOOD SPRINGS RD SUITE 4 STE 201 AUSTIN TX 78759-0444		Mail Stop PETITION COMMISSIONER FOR PATENTS P.O. BOX 1450 ALEXANDRIA VA 22313-1450	
EAS/rdd VRT0059US Date Mailed: May 14, 2004 [Petition to Make Special]			
PRESS HARD. You are making 3 copies. FOR PICKUP OR TRACKING CALL 1-800-222-1811 www.usps.com			



CAMPBELL  
STEPHENSON  
ASCOLESE LLP

4807 Spicewood Springs Road  
Building 4, Suite 201  
Austin, Texas 78759  
T: 512-439-5080  
F: 512-439-5099

Docket No.: VRT0059US

May 14, 2004

Mail Stop Petition  
COMMISSIONER FOR PATENTS  
P. O. Box 1450  
Alexandria, VA 22313-1450

**FILE COPY**

Re: Applicant(s): Oleg Kiselev  
Assignee: VERITAS Software Corporation  
Title: Application-Assisted Recovery From Data Corruption  
in Parity RAID Storage Using Successive Re-reads  
Application No.: 10/614,306  
Examiner: Unassigned  
Attorney Docket No.: VRT0059US

Dear Sir:

Transmitted herewith are the following documents in the above-identified application:

- (1) Return Receipt Postcard
- (2) This Transmittal Letter (1 page) *(in duplicate)*
- (3) Petition to Make Special Under 37 CFR §1.102(d) (7 pages)
- (4) Copies of 4 references for accompanying Petition
- (5) Information Disclosure Statement Under 37 CFR §1.97(b) (1 page)
- (6) PTO 1449 (citing 34 references) (1 page)
- (7) Copies of 19 foreign cited references



No additional fee is required.



The fee has been calculated as shown below:

- |  |           |
|--|-----------|
| <input checked="" type="checkbox"/> Fee Under 37 CFR § 1.17(h) for Filing a Petition to Make Special   | \$ 130.00 |
| <input type="checkbox"/> Fee for Petition for Extension of Time  |           |
| <input checked="" type="checkbox"/> Conditional Petition for Extension of Time: If an extension of time is required for timely filing of the enclosed document(s) after all papers filed with this transmittal have been considered, an extension of time is hereby requested. |           |
| <input checked="" type="checkbox"/> Please charge our Deposit Account No. _____  | \$ 130.00 |
| <input checked="" type="checkbox"/> Also, charge any <u>additional fees</u> required and credit any overpayment to our Deposit Account No. _____   |           |
| TOTAL  | \$ 130.00 |

**EXPRESS MAIL NUMBER:****EV 304739210 US**

Respectfully submitted,

Eric A. Stephenson  
Attorney for Applicant(s)  
Reg. No. 38,321  
Ph: 512-439-5093  
Fax: 512-439-5099